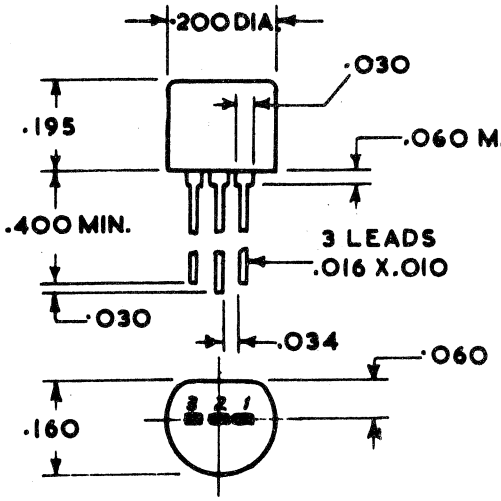
AMALGAMATED WIRELESS VALVE CO. PTY. LTD.

AS303

The AS303 is a silicon n-p-n planar transistor in an epoxy package, intended primarily for use in rf amplifier stages in T.V. and communication receivers. The type features low rf noise, high transition frequency, and low cutoff current.

DIMENSIONAL OUTLINE

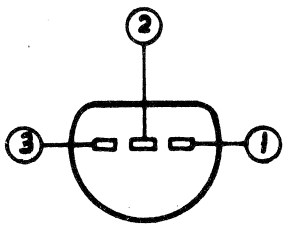


Dimensions in Inches

ABSOLUTE MAXIMUM RATINGS

Collector-base voltage	=	45 volts
Collector-emitter voltage (Base-emitter resistance = 100KΩ)	=	45 volts
Emitter-base voltage	=	4.5 volts
Emitter current	=	50mA
Base current	=	25mA

TERMINAL DIAGRAM



Lead 1—Emitter
Lead 2—Base
Lead 3—Collector

THERMAL RATINGS

Dissipation in an ambient temperature up to 25°C ------ 200mW max.
Derate linearly to zero at 135°C.

During soldering lead temperature must not exceed 255°C for 10 secs. max. within 1/16" of can.

Storage temperature -25°C to 135°C.

15.2.68

AS303

CHARACTERISTICS AT 25°C

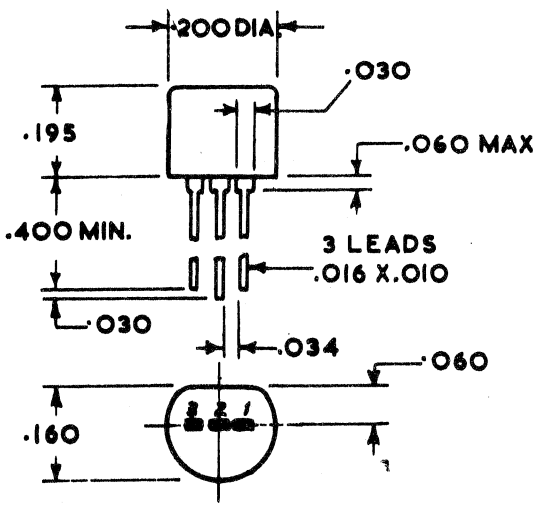
PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
I_{CBO}	V_{CB} = 1V			20	nA
I_{CBO}	V_{CB} = 45V			1	µA
I_{EBO}	V_{EB} = 4.5V			1	µA
V_{EBF}	V_{CB} = 45V			1	V
V_{CER}	I_C = 100µA, R_{BE} = 100KΩ	45			V
f_T	V_{CE} = 6V, I_E = 2mA, f = 100MHz		1000		MHz
h_{FE}	V_{CE} = 6V, I_E = 1mA	40		270	
$C_{b'c}$	V_{CE} = 8V, I_E = 0			1.4	pF
$R_{bb'}C_{b'c}$	V_{CE} = 6V, I_E = 2mA, f = 31.9 MHz		14		pS
NF	V_{CE} = 10V, I_E = 2mA, f = 216MHz		3.3		dB
	optimum source admittance,				
	common emitter circuit				

AMALGAMATED WIRELESS VALVE CO. PTY. LTD.

AS304 AS305 AS306 AS307 AS308

These units are n-p-n silicon planar transistors in an epoxy package for general H.F. and V.H.F. application. They are intended primarily for use in the tuner and if-amplifier circuits of vhf television receivers; and are also useful in communications equipment up to about 260 MHz.
Types AS304 and AS305 are vhf types, for use as mixer and local oscillator respectively in TV tuners to 220 MHz.
Types AS306, AS307, and AS308 are for use in 36 MHz TV if-amplifiers.
These types feature high transition frequencies and low cutoff currents.

DIMENSIONAL OUTLINE

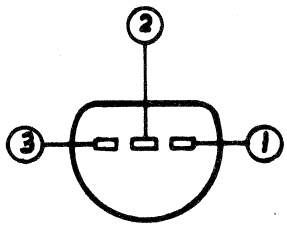


Dimensions in Inches

ABSOLUTE MAXIMUM RATINGS

Collector-base voltage	=	45 volts
Collector-emitter voltage (Base-emitter resistance = 100KΩ)	=	45 volts
Emitter-base voltage	=	4.5 volts
Emitter current	=	50mA
Base current	=	25mA

TERMINAL DIAGRAM



Lead 1—Emitter
Lead 2—Base
Lead 3—Collector

THERMAL RATINGS

Dissipation in an ambient temperature up to 25°C ------ 200mW max.
Derate linearly to zero at 135°C.

During soldering lead temperature must not exceed 255°C for 10 secs. max. within 1/16" of can.

Storage temperature -25°C to 135°C.

AS306
AS304 AS307
AS305 AS308

CHARACTERISTICS AT 25°C

PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
V_{BE}	I_{BE} = 20mA			1.2	V
I_{CBO}	V_{CB} = 1V			20	nA
I_{CBO}	V_{CB} = 45V			1	µA
I_{EBO}	V_{EB} = 4.5V			1	µA
V_{EBF}	V_{CB} = 45V			1	V
V_{CER}	I_C = 100µA, R_{BE} = 100KΩ	45			V
f_T	V_{CE} = 6V, I_E = 2mA, f=100MHz				
	AS304, AS305		1000		MHz
	AS306, AS307, AS308		800		MHz
I_B	V_{CE} = 6V, I_E = 1mA				
	AS304	3.6		25	µA
	AS305, AS308	3.6		37	µA
	AS306	6		25	µA
	AS307	11.6		37	µA
$C_{b'c}$	V_{CE} = 8V, I_E = 0			1.4	pf
$R_{bb'}C_{b'c}$	V_{CE} = 6V, I_E = 2mA, f=31.9MHz		14		ps

AS303
AS304
AS305
AS306
AS307
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CHARACTERISTICS AT 25°C

Typical Input Characteristics

Common Emitter Circuit, Base Input
Collector-to-emitter volts (V_{CE}) = 10

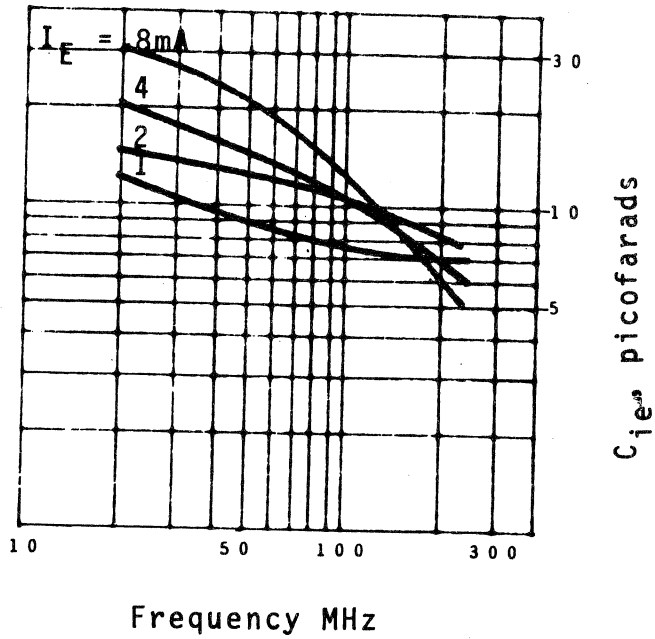

Fig. 1

Input Capacitance C_{ie}

C_{ie} is constant within about 3% between V_{CE} = 5 and V_{CE} = 15

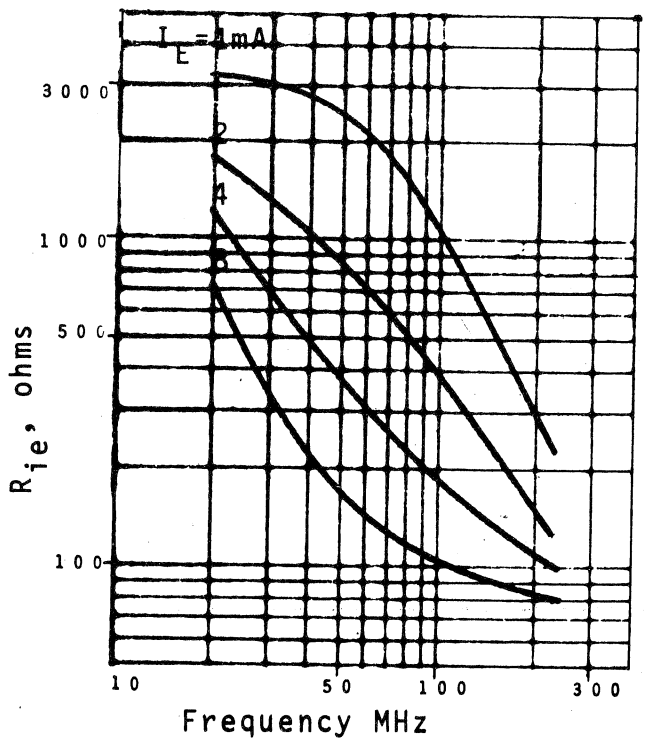

Fig. 2

Input Resistance R_{ie}

R_{ie} increases about 2% per volt increase in V_{CE} between V_{CE} = 5 and V_{CE} = 15

CHARACTERISTICS AT 25°C

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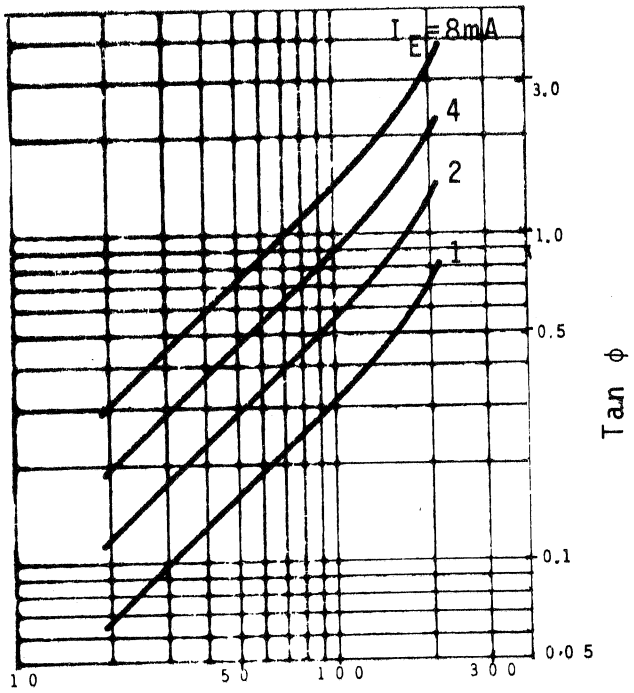
Typical Transconductance Characteristics

Common Emitter Circuit, Base Input
Collector-to-emitter volts (V_{CE}) = 10

Fig. 3

Tangent of Phase Angle, ϕ

Tan ϕ is constant within 1% between V_{CE} = 5 and V_{CE} = 15.



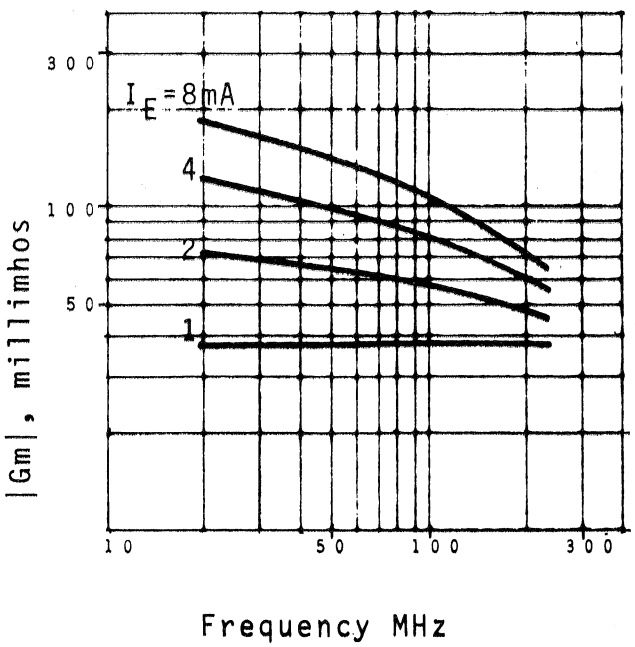


Fig. 4

Absolute Magnitude of Transconductance, |Gm|

|Gm| falls about 0.4% per volt increase in V_{CE} between V_{CE} = 5 and V_{CE} = 15

CHARACTERISTICS AT 25°C

Typical Output and Feedback Characteristics

Common Emitter Circuit, Base Input

AS303
AS304
AS305
AS306
AS307
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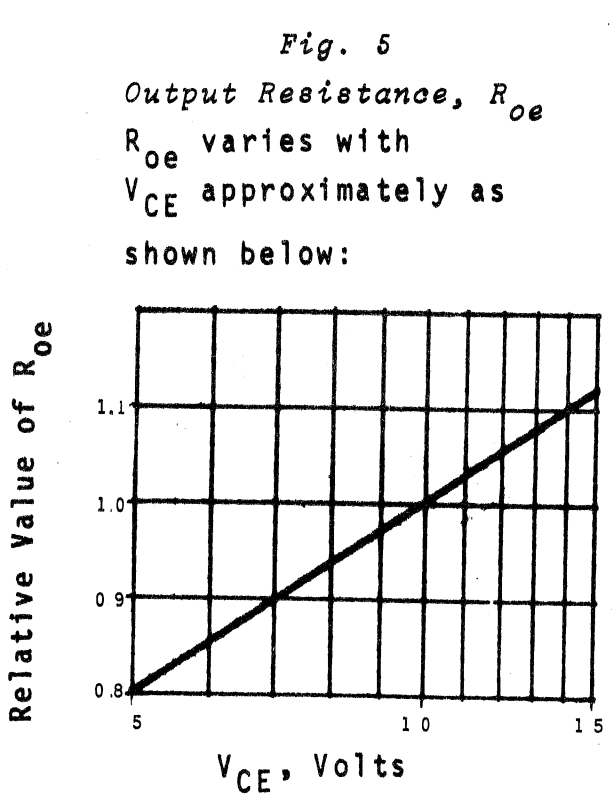
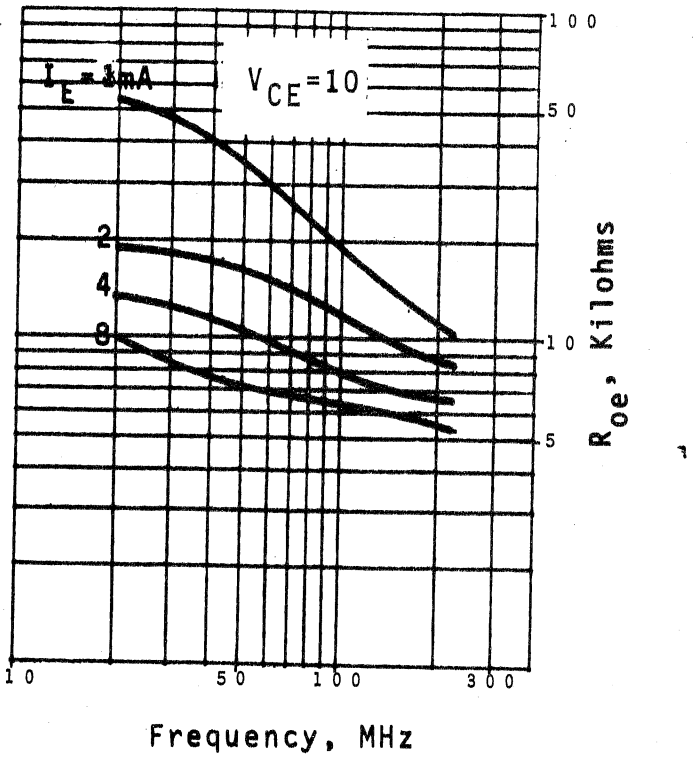
Fig. 5

Output Resistance, R_{oe}

R_{oe} varies with V_{CE} approximately as shown below:





Output Capacitance, C_{oe}:

C_{oe} has typically the value 2.1 pF and is essentially independent of frequency, I_E and V_{CE}.

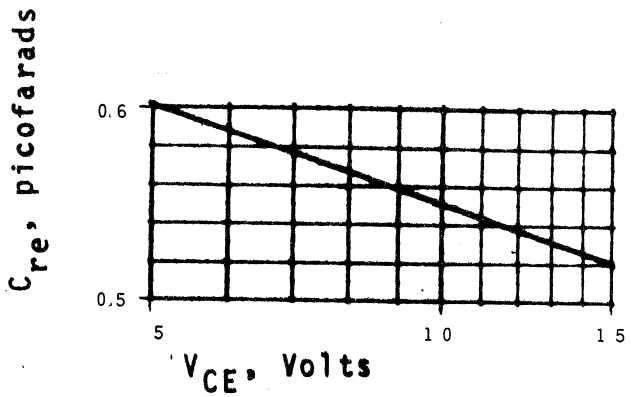


Fig. 6

Feedback capacitance, C_{re}

C_{re} is essentially independent of frequency and I_E

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CHARACTERISTICS AT 25°C

Y PARAMETER VALUES

PARAMETER	CONDITIONS			MIN.	TYP.	MAX.	UNITS
	f, MHz	I_E, mA	V_{CE}, volts				
Coe	20 - 220	1 - 8	5 - 15		2.1		pf
Roe	55	1.5	7.5		60		KΩ
	"	8	"		7		KΩ
	110	1.5	"		30		KΩ
	"	6	"		6.5		KΩ
	220	1.5	"		10		KΩ
	"	4	"		7		KΩ
Cre	220	1	5		.60		pf
	"	"	10		.55		pf
	"	"	15		.52		pf

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